Perceptions of students about Problems in Computing Higher Education

Uyara Ferreira Silva[1,2], Deller James Ferreira[1], Dirson Santos de Campos[1], Anderson Cavalcante Gonçalves[1]

[1]Federal University of Goiás, Goiânia, Brazil, [2]Federal Institute of Goiás, Formosa, Brazil

Abstract

Female students face various problems in the undergraduate computer science environment. In this paper we investigate undergraduate computer science students' perceptions of discrimination, harassment, drop out intention, gender devaluation, sense of belonging, gender stereotype, and self-efficacy. It also collects information about unpleasant facts that happened to students. A questionnaire was applied to two hundred and fifty students from undergraduate computer science courses from more than twenty universities in Brazil. Data from the questionnaire were analyzed using statistical methods. A comparison between men and women experiences is provided. In addition, we examine correlations between issues reported by the female students and their intentions to leave university. The results show that the majority of students in both sexes have a low sense of belonging and also that men bear some of the problems. Nevertheless, women suffer more from discrimination and gender stereotype than men.

Keywords: undergraduate computer science; students' perceptions; gender discrimination; statistical analysis;

1. Introduction

There are many studies on problems faced by female undergraduate computer science students. The percentage of women attending computing science courses in higher education is dramatically lower when compared to men, being among the lowest rates in higher education. STEM disciplines have traditionally been male-dominated, with computer science having one of the lowest proportions of female degree recipients among STEM disciplines (National Science Foundation, 2019). In addition, the number of women interested in computing is dropping (Misa, 2011). According to the newspaper of the University of São Paulo (USP), in the last five years, only 9% of students trained in the Computer Science course at the Institute of Mathematical and Computer Sciences (ICMC) at USP in São Carlos were women; in the Bachelor of Information Systems, 10% and Computer Engineering, 6%.

Computer science is seen as a male gendered subject. Concerning women, there are gender stereotype misconceptions regarding physical appearance, personality type, and digital ability. Females who choose to study computing are seen as having low self-worth as well as being different, atypical and unattractive. These myths can influence their academic decisions resulting in poor women' uptake of computing science as a career (Berg et al., 2018). The "geek" is another stereotype that may interfere with women's lower sense of belonging that could be traced to lower feelings of fit with computing stereotypes (Master et al., 2016).

Some harassment can potentially affect negatively women' psychological states during undergraduate computer science. The Federal Court of Justice of Brazil created a harassment and discrimination guidance

guide. In this guide there are the terms mansplaining, gaslighting, manterrupting and bropriating. Mansplaining occurs when a man undermines a woman's knowledge, and devotes his time to explain something obvious to her, as if she couldn't understand by virtue. Gaslighting corresponds to emotional violence through manipulation which leads the woman and everyone around her to think she has gone mad or is incapable. Manterrupting occurs when women cannot finish her ideas because of unnecessary interruptions made by men. Bropriating occurs when a man appropriates the idea of a woman, and takes the credits in her place.

Other potential psychological obstacles inhibiting women' computer usage are their personal feelings of low or missing computer self-efficacy. Women attribute the failures more internally, to their own inability. Men attributed the failures more externally, to the faulty from the technical equipment (Koch et al., 2008). Also, associations between heavy digital media use and low psychological well-being are larger for adolescent girls than boys (Twenge, 2020). Additionally, regardless of the gender, parental support is one factor that has been strongly associated with both boys' and girls' computer self-efficacy and value beliefs (Vekiri et al., 2008).

According with the literature, stereotype and gender discrimination affects female students more than affects male students in computing. Furthermore, women's sense of belonging is generally lower than men's in computer science education (Casad, 2019). Concerning the evasion from computer science higher education, it is important to highlight what problems affect and influence women the most.

Many works attempt to establish the problems suffered by women who pursue a computing career and propose solutions to keep them in the field. However, there are few works that show student's perceptions respecting problems previously validated, testing whether gender issues really happen more with women in university computing environments (García-Holgado et al., 2018). With respect to the Brazilian context, there are few studies that answer whether a certain category of problem influences women's intention to evade.

In order to unveil what problems are present in the Brazilian scenario, this present research collected data from computer science students from twenty-three Brazilian universities all over the country, through an online questionnaire. We developed the questions according to problems pointed out by the international studies. We performed descriptive and inferential statistical analysis to clarify and provide insights on the students' perspectives. Understanding this scenario is very important for educators to have the endowment to make changes in the classroom. Teachers should gain knowledge that can aid for further actions concerning students' wellbeing. According to Li (2006), the majority of the harassment victims and bystanders did not report the incidents to professors because they think nothing will be done about it.

2. Related Works

According to García-Holgado et al. (2019), it is important to develop actions to encourage diversity in the educational framework. Gender studies are considered the starting point to propel actions to decrease the gender gap in computer science. Education programs should broaden its foundations to provide equal education for both genres, by including the influence of social stereotypes and dominant culture. However, few works provide insight into potential causes of inequity in computer science undergraduate courses, aiming to enlighten future educational policies.

García-Holgado et al. (2018) elaborated and validated a questionnaire on gender perspectives, in order to capture the students' perceptions of what changes could be carried out to reduce the gender gap. Their work is part of a teaching innovation project entitled "Inclusion of the gender perspective in Software Engineering: Module 1", funded by the University of Salamanca (Spain) in the 2016/2017 academic year.

In Cheryan et al. (2019) study, the relationship between women's expression of interest in computer science and identity expression threat is examined. Women who intend to graduate in computer science report greater identity expression threat from their peers outside computer science than from those inside the field. Also, women report greater identity expression threat in computer science than do men. These reports were acquired through questionnaires applied to US university students.

Women and men have different motives and expectations for choosing computer science, and usually evaluate their strengths and abilities in different ways. The paper Volkel et al. (2018) provides an analysis of current motives for male and female choosing computer science as a subject of study. Data were obtained through interviews and questionnaires applied to computer science students in Germany. The study found out that the most crucial motive determining participants' choice to pursue a computer science career was interest in the contents. Other interesting findings are that male have often developed an interest very early as children, while women encounter computer science in high school or later. Female high school students often do not enter programs in computing due to a lack of interest and confidence. This situation could be attributed to women's beliefs that a computer scientist has a large expertise in programming and technology. Furthermore, women are less interested in innovative technologies than men.

According to Michell et al. (2018), in Australia the under-representation of women in computer science reflects the under-representation of women at the highest levels of government and business. The authors argue that interest and engagement in computer science is influenced by teachers, peers and parents. The survey aimed to collect quantitative and qualitative data on some aspects of teaching digital technologies in secondary schools. Among these aspects are existing policies and resources in schools to support digital technology learning, whether gender diversity in teaching is perceived by teachers and, if so, what teachers do to address this problem. A majority of survey respondents reported they were inadequately trained to teach a diverse group of students, and those who invested in diversity strategies were unaware of the ways in which they could overcome gender stereotypes. The results of the work point that teachers require support in terms of material resources and sustainable workloads to reduce the gender gap.

The survey Cheryan et al. (2015) points out that computer science and engineering are stereotyped in modern American culture as male oriented fields that involve social isolation, an intense focus on machinery, and inborn brilliance. Those stereotypes steer girls away from choosing to enter these fields. However, broadening the representation of the people who do this work, and the environments in which it occurs, significantly increases a girl's sense of belonging and interest in the field. Also, statistical analyses indicated that gender disparities in interest and anticipated success in the stereo-typically designed classroom were mediated by women's lower sense of belonging in that environment (Cheryan et al., 2011). However, providing them with an educational environment that does not fit current computer science stereotypes increases their sense of belonging in computing courses, helping reduce gender disparities in these fields (Master et al., 2016).

According to Ruthotto (2020), the unwelcoming, "chilly" climate that female science students experience in the traditional classroom is equally prevalent in online environments, for example, online discussion boards include linguistic cues that expose gender anonymity, considering the presence of male person. One factor contributing to the persistent underrepresentation of women in STEM is this stereotypical environment that perpetuates the image of a geeky, nerdy culture in which women do not fit. Stereotypical judgments can lower women's self-efficacy and increase self-blame in situations of failure. Stereotypes have also been linked to undermining women's sense of belonging in the computer science

field and classroom.

Another very serious problem faced by girls in computing is cyberbullying, which is nothing but traditional bullying virtualized. The critical variable which predicts the difference in cyberbullying experience between males and females is affective empathy. Males tend to bully others more than females did because males seem to be less empathetic than females (Topcu et al., 2012). Another survey with high school students shows that close to half of the students were bully victims and about one in four had been cyber-bullied. The majority of the victims and bystanders did not report the incidents to teachers (Li, 2006). Cognitive and affective empathy are important for both traditional bullying and cyberbullying, independent of gender, age and nationality (Del Rey et al., 2016).

Students who experience uncertainty and distress about their belonging are left with less time to spend on their academics as the time and energy they could put into learning and building connections is spent on concerns that they do not belong in their field or major. Sense of belonging is a known predictor of success in college. Women and underrepresented minorities are more likely to feel less belonging to STEM fields (Sax et al., 2018).

In summary, computer science has been diagnosed as a field with an expressive gender gap despite the crescent pervasiveness of computing. Several factors along with attitudes and exposure to computer science, computer programming proficiency, and self-reliance in using computers are understood to be linked with the low participation of women in this field (Hinckle, 2020). Nonetheless, some explanations have been posed to this gender gap, encompassing varying degrees of evidence, proving evidence that there is no single or small set of reasons to interpret this gap and pointing to the necessity for supplementary investigations (Duncan et al., 2020). Thus, there is a demand for further work concerning the intricate issues involving the gender gap in computer science education.

3. The Study

Given the importance of solving the problem of gender gap, the main contribution of this work is to offer clues regarding the students' perceptions of the problems suffered by undergraduate computer science female students. Our aim is to provide a statistical analysis in regard to the perceptions of both female and male students, answering what difference can be expected from women's and men's perceptions. In addition, we intend to provide information on what kind of bad college experiences they report. Also, we intend to provide insights into what problems from literature are the worst and if women really suffer from them more than men. Finally, we attempt to reveal if there is a correlation between problems reported by women and problems reported by men as well as the correlation between perceptions and facts.

Our justification for focusing students' perceptions is to verify if problems previously validated in the scientific literature are recurrent in undergraduate computer science in Brazil and how are the students' perceptions related to them. With this information we can help educators and who else may be interested in understanding the real scenario in computing higher education in Brazil. The information revealed in the results could help educational institutions to take steps to increase students' sense of belonging and reduce evasion.

3.1 Method

To obtain the data, a questionnaire was created to be answered by computer science undergraduate students from all over Brazil. The questionnaire contains twenty questions to validate the main problems suffered by women mentioned in several bibliographies. Thirteen questions (1—13) are about students' perceptions about the university environment and seven questions (14—20) are about negative facts that

have occurred. The questionnaire was released to groups of women in computing, such as the Digital Girls Program that helped to recruit the female students. We also sent the questionnaire digitally to several universities in Brazil, using the e-mail boxes of the Headers of the Computer Science Departments, that asked for IT employees to forward the questionnaire to the students. This research was approved by the ethics committee of the Federal University of Goiás. The questionnaire is described as follows:

1. Do you think that people of your gender that work in computing are valued by others?
2. Do you think that your gender will influence in getting a good job in the field of computing?
3. Do you feel discriminated against for studying computer science?
4. Does gender stereotype bother you?
5. Do you worry about people that draw conclusions about your performance based on your genre?
6. How well do you think you would be working with computing?
7. How good a student do you think you are?
8. How similar do you think you are to your colleagues who also study computing?
9. How close are you to the people in your college?
10. Do you think you would fit into the field of computing?
11. Do you worry about being negatively labeled for studying computing?
12. What are the chances of you NOT completing the undergraduate computer science?
13. What are the chances that you will NOT pursue a career in the computing field?
14. Have your peers or teachers provoked you (negatively) by studying computing? For instance: They gave you derogatory nicknames.
15. Have your colleagues or teachers already interrupted you while you spoke, not allowing you complete your reasoning?
16. Have your colleagues or teachers implied that you were losing reason by giving any opinion different from theirs?
17. Have your colleagues ever underestimated you? For example, they have explained something obvious with some intonation that bothered you.
18. Have your colleagues ever appropriated an idea of yours as if they were theirs and took credit?
19. Have you ever been harassed within the educational institution?
20. Has anyone in the institution made jokes, innuendos or embarrassed you in any other way?

The answers are multiple choice and follow the Likert scale (Faleiros et al., 2016). For the answers to the questions about sensations, the Likert scale followed the standard 1 = nothing, 2 = little; 3 = neutral, 4 = reasonably, 5 = a lot. For the answers to the questions about facts, the Likert scale followed the standard 1 = never, 2 = once, 3 = two or three times, 4 = four times, 5 = more than four times. For data analysis, 250 student responses from 27 computing courses from 23 higher education institutions were considered. Before the release of the questionnaire to the public, a pre-test was conducted with a test group containing ten female students of computing. Through the pre-test, it was possible to improve the questions to make them clearer.

Descriptive statistics were applied to reaffirm the problems faced by students and also to compare which ones affect women the most and which ones affect men the most. Through this statistical analysis it

was also possible to rank which problems occur most. We obtained the median of the answers because in the Likert Scale the variables are ordinal and qualitative, it makes median more interesting than mean or mode, that are used for interval variable and nominal variable, respectively.

Some interesting correlation and difference tests were also made. In the case of this study, the design context is inter-subject with two groups, one for each genre. The dependent variable is ordinal, represented by the responses on the Likert scale. We used Spearman's correlation coefficient to check the associations between answers of men and answers of women. To verify differences detected in the data sample (answers of men and women) we used Mann-Whitney test. Spearman's correlation coefficient is an association test that explores whether two (or more) ordinal variables (or one ordinal and one interval) are associated. The correlation coefficient of Spearman allows the evaluation of the strength and direction of this association, varying between +1 and -1. The Mann-Whitney test is applied to compare differences among two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed (Martins, 2011).

In statistical tests there is no absolute certainty. If the probability is too high then the results are statistically not significant. Otherwise they are significant. In this study the null hypothesis is represented by H0 (the result found is due to chance) and the alternative hypothesis is represented by H1 (the result found is not due to chance). The variable p represents the probability for correlation or difference, is a probability that measures the evidence against the null hypothesis. If $p > 0.05$ the result is not significant. If $p \leq 0.05$ the result is significant.

4. Results

The present study approaches the gender issues underneath undergraduate computer science courses. Understanding students' perceptions and concerns is an important addition to experimental studies in the computer science education field to broaden our understanding concerning gender limitations. Students' perceptions can be useful when it comes to designing future educational approaches. The results of the questionnaire statistical analysis are as follows.

3.1 Descriptive Statistics

Among the 250 students who answered the questionnaire 40.4% were women, 58.8% were men, and 0.8% identified themselves as having another gender. The fact that the questionnaire was first released to groups of women explains the equivalent proportion of responses from girls and boys. We will keep information from people who have declared themselves non-binary for future research, as the focus of this survey is on women in relation to men. Non-binary people can have different and even more serious problems.

Table 1 shows the median of each response for both sexes (general column) as well as the median of the options chosen by women and men in the Likert Scale for all twenty questions. We refer to each question as Q_x, where 'x' represents the question number.

Table 1. Median of Likert scale for general, women and men

	General	Women	Men
Q_1	4	2	5
Q_2	4	4	4
Q_3	2	3	1
Q_4	3	4	2
Q_5	3	5	2
Q_6	4	4	4
Q_7	4	4	4
Q_8	3	3	3
Q_9	4	4	4
Q_{10}	4	4	4
Q_{11}	1	2	1
Q_{12}	2	2	2
Q_{13}	2	2	2
Q_{14}	1	1	1
Q_{15}	2	3	2
Q_{16}	1	1	1
Q_{17}	2	3	2
Q_{18}	1	1	1
Q_{19}	1	1	1
Q_{20}	2	2	1

Median of each response for both sexes (general column) as well as the median of the options chosen by women and men in the Likert Scale for all twenty questions.

The disproportion between the perceptions of women and men are more noticeable in the answers of questions 1, 3, 4, 5, and 11, as shown in Table 1. The median of the answers to Q_1 is 4 for all students, 2 for women and 5 for men, a 3-point difference between women and men, as shown in Figure 1. Answers to Q_3 have a median 2 for the entire sample, 3 for women and 1 for men, difference in 2 points between girls and boys, as depicted in Figure 2. The answers to Q_4 have a median 3 for all students, 4 for women and 2 for men, a 2-point difference between women and men, as described in Figure 3. The answers to Q_5 have a median 3 for all students, 5 for women and 2 for men, difference between 3 points between women and men, as shown in Figure 4. Figure 5 shows the answers to Q_{11}, which has a difference of only 1 point between the responses of men and women. The bar graphs in Figure 1, Figure 2, Figure 3, Figure 4, and Figure 5 also show how many students chose each answer in Q_1, Q_3, Q_4, Q_5, and Q_{11}, and the gender of each student are presented, the bar representing men's responses is to the left of the bar representing women's responses. For instance, 75 men choose answer 5 = a lot for Q_1 - *Do you think that people of your gender that work in computing are valued by others?*, and only 3 women choose answer 5 = a lot for Q_1.

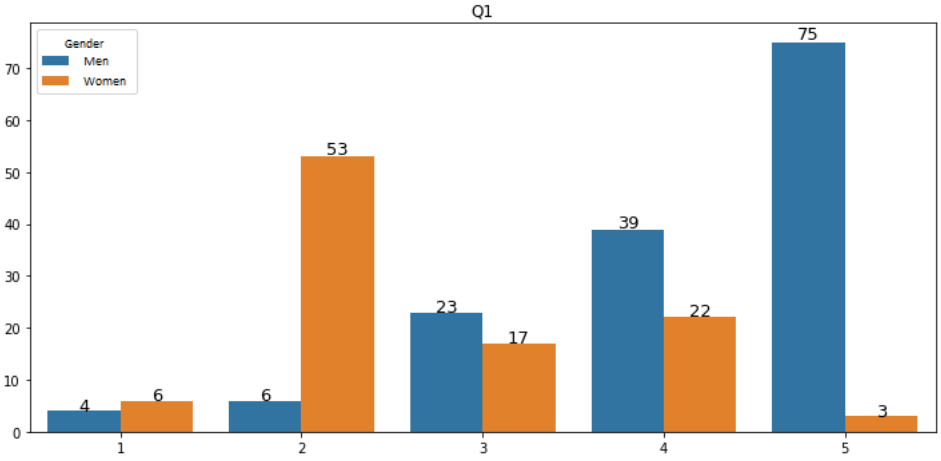

Figure 1. Answers to Q_1.

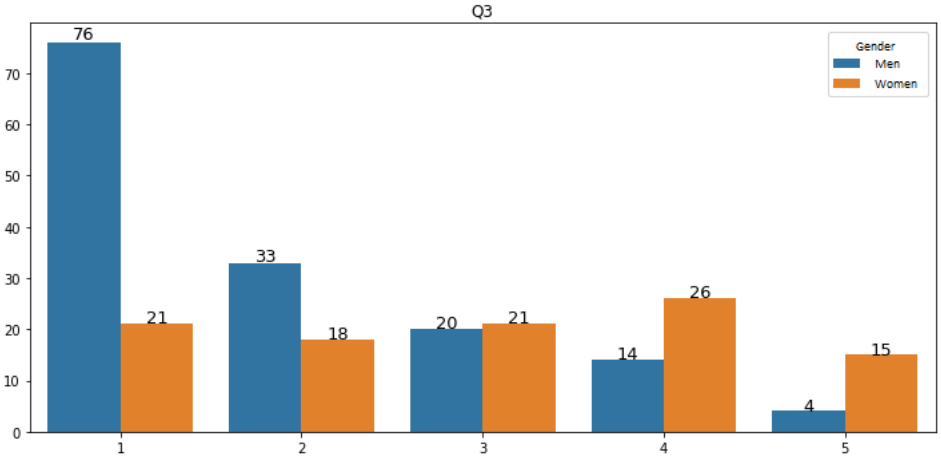

Figure 2. Answers to Q_3.

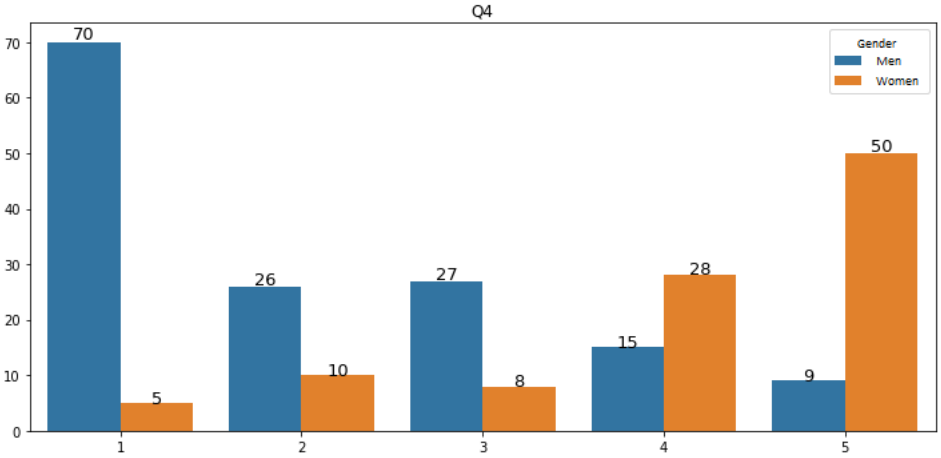

Figure 3. Answers to Q_4.

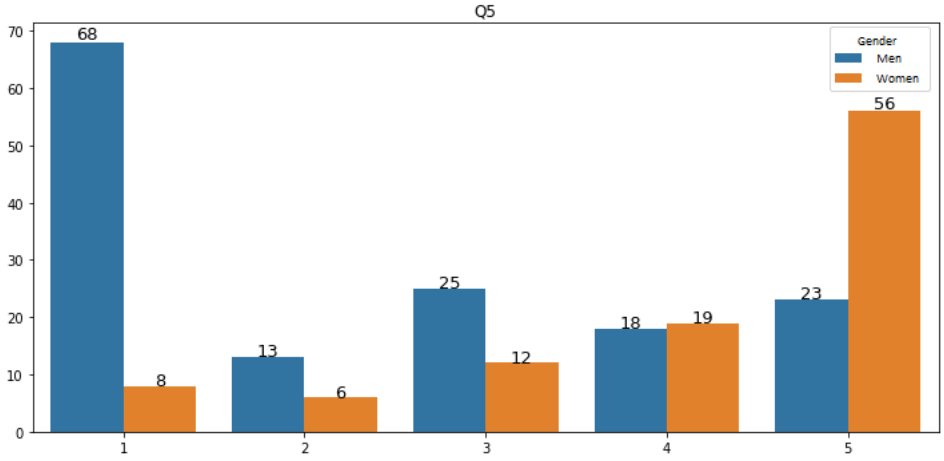

Figure 4. Answers to Q_5.

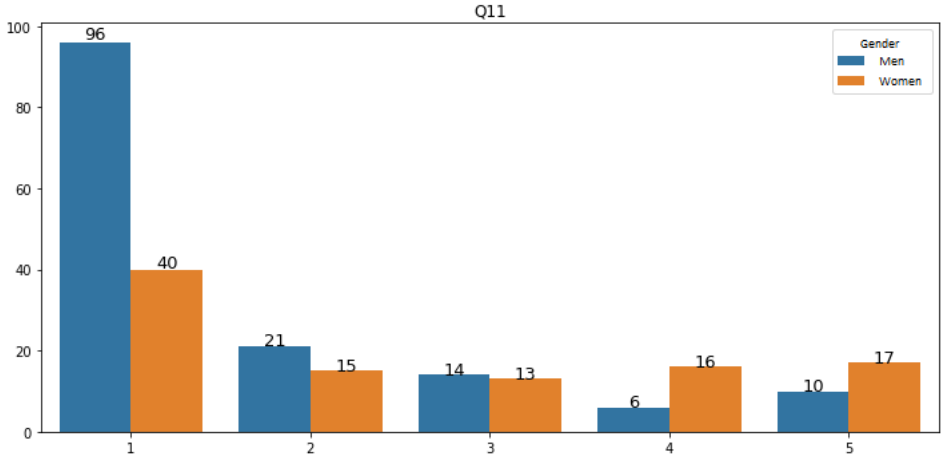

Figure 5. Answers to Q_{11}.

The disproportion between the facts occurred with women and men are noticeable in Q_{15}, Q_{17} and Q_{20}, as shown in Table 1. However, the difference in the responses of men and women to these three questions is no more than 1 point. This is not to say that adverse events with girls are substantially higher or lower. Therefore, in addition to the tests of association and difference, future work consists of analyzing the students' reports in discursive responses, as shown in Figure 6, Figure 7, and Figure 8.

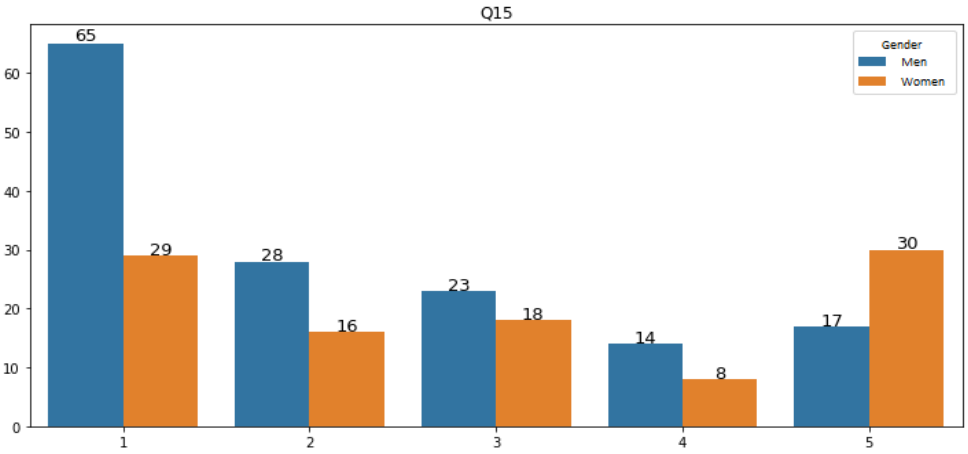

Figure 6. Answers to Q_{15}.

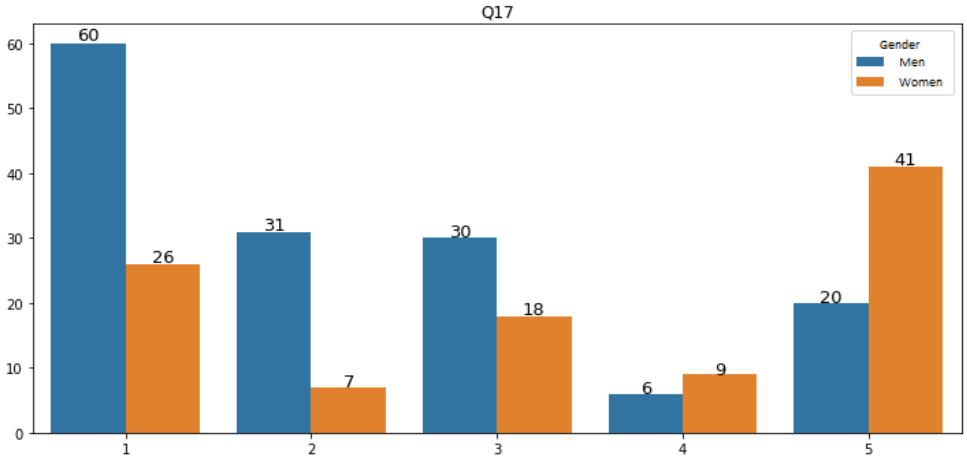

Figure 7. Answers to Q_{17}.

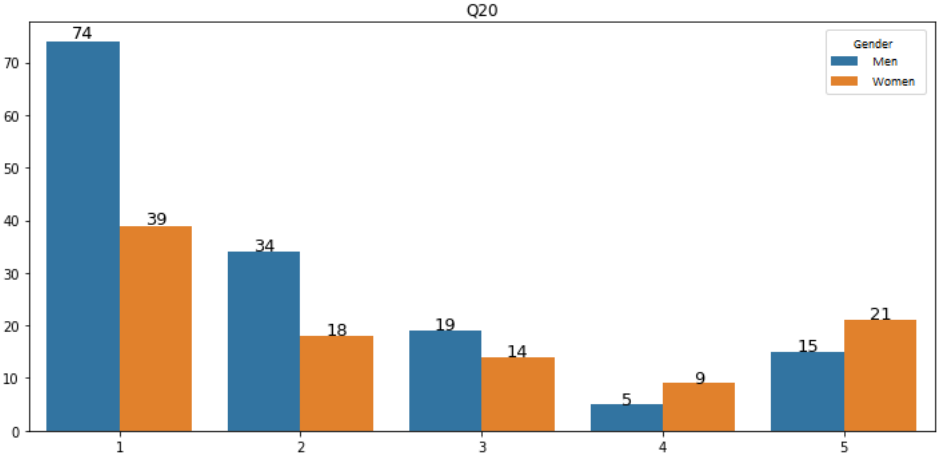

Figure 8. Answers to Q_{20}.

3.1 Inferential Statistics

Correlations between women1 intention to evade and self-efficacy, sense of belonging, perspective of working with computing, difficulty to find a good job, gender devaluation in computing, and manterrupting

were done. The most interesting are presented below in order of most significant to least significant correlation.

In Figure 9, the investigation question and hypotheses were:

- Investigation question: Women's intention to evade are correlated with self-efficacy in studies? H0: There is no correlation between intention to evade and self-efficacy in studies.
- H_1: There is a correlation between intention to evade and self-efficacy in studies.

Figure 9. Correlation test between Q_7 and Q_{12}.

In Figure 10, the investigation question and hypotheses were:

- Investigation question: Women's intention to evade are correlated with their sense of belonging?
- H_0: There is no correlation between intention to evade and sense of belonging.
- H_1: There is a correlation between intention to evade and sense of belonging.

Figure 10. Correlation test between Q_8 and Q_{12}.

In Figure 11, the investigation question and hypotheses were:

- Investigation question: Women' intention to evade are correlated with their perspective of working with computing?
- H_0: There is no correlation between intention to evade and perspective of working with computing.
- H_1: There is a correlation between intention to evade and perspective of working with computing.

Figure 11. Correlation test between Q_6 and Q_{12}.

In Figure 12, the investigation question and hypotheses were:

- Investigation question: Women's intention to evade are correlated with their difficulty to find a good job?
- H_0: There is no correlation between intention to evade and difficulty to find a good job.
- H_1: There is a correlation between intention to evade and difficulty to find a good job.

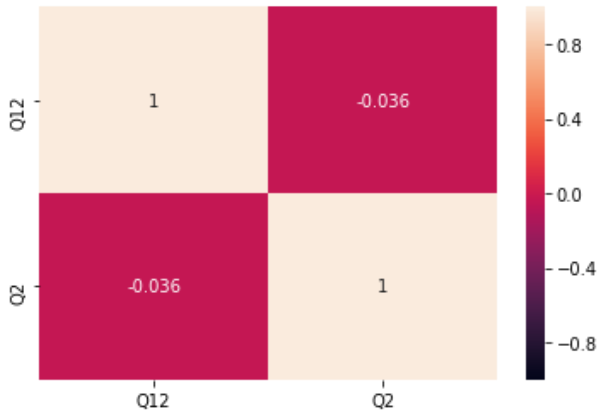

Figure 12. Correlation test between Q_2 and Q_{12}.

In Figure 13, the investigation question and hypotheses were:

- Investigation question: Women's intention to evade are correlated with the gender devaluation in computing?
- H_0: There is no correlation between intention to evade and gender devaluation.
- H_1: There is a correlation between intention to evade and gender devaluation.

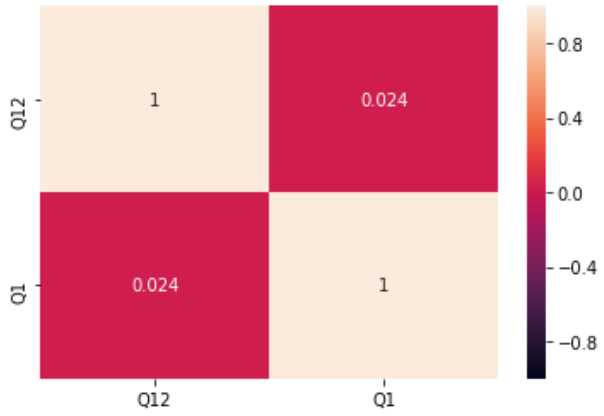

Figure 13. Correlation test between Q_1 and Q_{12}.

In Figure 14, the investigation question and hypotheses were:

- Investigation question: Women's intention to evade are correlated with manterrupting?
- H_0: There is no correlation between intention to evade and manterrupting.
- H_1: There is a correlation between intention to evade and manterrupting.

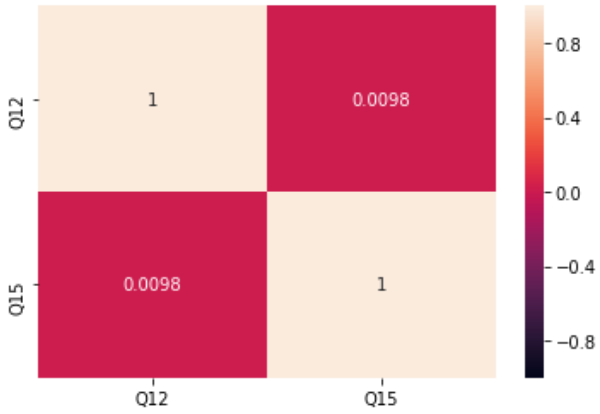

Figure 14. Correlation test between Q_{15} and Q_{12}.

For all six correlation tests described above one must accept the alternative hypotheses.

The Mann-Whitney difference test is non-parametric, inter-subject, and suitable for ordinal variables. Some difference tests have been done, but only one has significant difference, presented below.

- Investigation question: Is there a difference between the women's intention not to pursue a computing career and the men's intention not to pursue a computing career?
- H_0: There is no difference between the women's intention not to pursue a computing career and the men's intention not to pursue a computing career.
- H_1: There is a difference between the women's intention not to pursue a computing career and the men's intention not to pursue a computing career.
- We have to accept the alternative hypothesis, since $p = 0.0056$.

5. Discussion

Q_1, Q_5 and Q_{20} address the problem of gender devaluation, Figure 1, Figure 4 and Figure 8. Q_1 asks if

people of the same gender that work in computing field are valued by others. Median of women responses to this question are 4 = reasonably. Men's replies median to this question are 5 = a lot. Q_5 asks regarding concern about others' opinions on gender-based performance. Median of women responses to this question are 5 = a lot. Men's replies median to this question are 2 = little. These responses show that men feel more valued and are less bothered by what others think about their choice of profession, as expected according to the aforementioned bibliographies. Unfortunately, women who study computer Science University do not have the feeling of recognition coming from teachers and colleagues. Often when teachers spend activities that are considered difficult, they hope that girls will not succeed or will only succeed with the help of a male colleague.

Q_3 addresses the problem of discrimination, as well as Q_{15} and Q_{17}. Q_3 asks about the perception of being discriminated against for studying computing. Median of women responses to this question are 3 = neutral. Men's replies median to this question are 1 = nothing, Figure 2. These responses prove that what the literature cited said about gender discrimination is true. Women are discriminated against for studying computing, while boys who study computing are praised and admired. Q_{15} is about manterrupting, when the woman is interrupted by peers and teachers, unable to conclude any reasoning. Although manterrupting is a term used as aggression suffered by women, men also answered this question to ascertain their perceptions. Median of women responses to this question are 3 = two or three times. Median of men responses to this question are 2 = once, Figure 6. Girls are interrupted by boys more often than boys interrupt other boys. This intimidates girls to expose their ideas and even influences them to prevent them from asking questions, for fear and fear that they will be interrupted and even humiliated. Q_{17} is about mansplaining, when women are underrated by men. Women and men answered whether colleagues or teachers already underestimated them. Median of women responses to this question are 3 = two or three times. Men's replies median to this question are 2 = once, Figure 7. With all this underestimation that girls suffer, it is common that even those who have some courage to ask something, are again humiliated when they hear explanations of the obvious, for example, they can ask about some specific tool of the Java language and hear as answers what is Java, even though she has already created several software by herself.

The stereotype pointed by many studies as the biggest problem faced by undergraduate computer science females is confirmed from the answers to Q_4 and Q_{11}, Figure 3 and Figure 5. The question asks about the stereotype of discomfort within the university environment. Median of women responses to this question are 4 = reasonably. Men replies median to this question are 2 =little. Even if there is a stereotype of boys who study computing, it is not so unpleasant, because they are considered very intelligent boys who will earn a lot of money. However, the stereotype of girls who study computing is that they have an undesirable appearance, introverted personality, and will not receive good salaries.

Another interesting answer was from Q_8, regarding the similarity with colleagues who also study computing. Both genders have a median 3 = neutral, Table 1. It may mean that students' sense of belonging is average overall. Probably, the reason for the low sense of belonging of boys is different from that of girls. All discrimination, devaluation of gender and stereotype lead girls to feel isolated and frustrated, sometimes they see the dropout as an escape.

The six correlation tests show that women's intention to evade the undergraduate computer science correlates significantly with various problems they face. It is the case of the perception of low self-efficacy,

low sense of belonging, the lousy perspective of working with computing, challenging to find a good job, and gender devaluation in computing.

Several problems found in universities in other countries were mapped to universities in Brazil. To alleviate these problems, Brazilian universities need to adopt educational models to reduce the issues reported by female students in this work. The practical implication of this work is to direct educational policies, drawing attention to the possible problems that most contribute to the evasion of women from undergraduate computer science courses in the Brazilian scenario.

6. Conclusion

Some research works report problems suffered by female computer science undergraduate students. In this work, we consider some of these works as a base to a questionnaire to collect information about the students' perceptions of problems and unpleasant facts that occurred with them inside and outside the educational Brazilian institutions.

We made a descriptive statistics analysis using data collected from 250 questionnaire responses applied to 23 computer science education institutions. The questionnaire addresses the issues of discrimination, harassment, and drop out intention, gender devaluation, and sense of belonging, gender stereotype, and self-efficacy.

By means of the students' replies, we conclude that women feel more undervalued than men studying computing. Also, there is a vast disparity regarding concern about others' opinions on gender-based performance. Women are much more concerned with the views of others. The perception of being discriminated against is much higher in women. As well as negative facts about discrimination were more pointed by women. Women reported more unpleasant facts about being interrupted when talking and underestimated. We conclude that they suffer more discrimination. Also, stereotyping bothers more women than men. Additionally, through the correlation tests, we conclude that various problems faced by women are significantly correlated to their intention to evade.

The current scenario demands attention to the problems faced by computer science students of both sexes. The sense of belonging of the undergraduate computer science students is low, and something has to be done about it. Universities and other educational institutions need to make efforts to mitigate the issues reported by the students. This work calls attention to the possible issues that most contribute to the dropout of women from higher education courses and contributes to understanding what problems that most disturb students.

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